APPENDIX C

CASE STUDY FOR
ADDING PUMPS TO AN EXISTING SYSTEM

C-1. The impact on existing system performance was analyzed for adding three new pump stations to handle peak flow requirements in 15 years. A summary of the case study is as follows:

    a. The existing system included the following elements:

      (1) Seven wells and pumps as the supply source.

      (2) Network of distribution mains served by feeder mains from seven points of supply.

      (3) Storage facilities included an underground reservoir and three elevated tanks riding on the system.

    b. A mathematical model network was developed based on extensive field testing and survey of actual sting operating conditions to be used for the hydraulic analysis of the system to handle present and future demands in 15 years. Figure C-I identifies the system.

C-2. The analysis of the existing system concluded the following deficiencies:

    a. Existing wells and distribution system would be unable to deliver the normal daily demands in 15 years and grossly deficient to deliver fire flow demands.

    b. Pressures would be inadequate at the peak flow rate and to satisfy fire flow requirements. Figure C-2 shows the pressure contour map.

    c. On the basis of established criteria for the system, the system storage was deficient.

    d. System performance for the extended period was analyzed and the following improvements to overcome the deficiencies were recommended:

      (1) Three underground reservoirs for additional storage.

      (2) A surface water supply source with delivery to the three underground storage reservoirs.

      (3) A pump station at each proposed reservoir.

      (4) Additional means for fire protection in remote areas.

    e. The following findings were derived from these analyses:

      (1) The improved system would generally result in increased pressure throughout the service area. The minimum pressure in the network model increased approximately 10 psi. Refer to figure C-3 for improved distribution system contour map.

      (2) The hydraulic network analysis also determined the supply point. This information was used to establish the storage requirements at each reservoir site and to select pumps for the pumping stations at these locations.
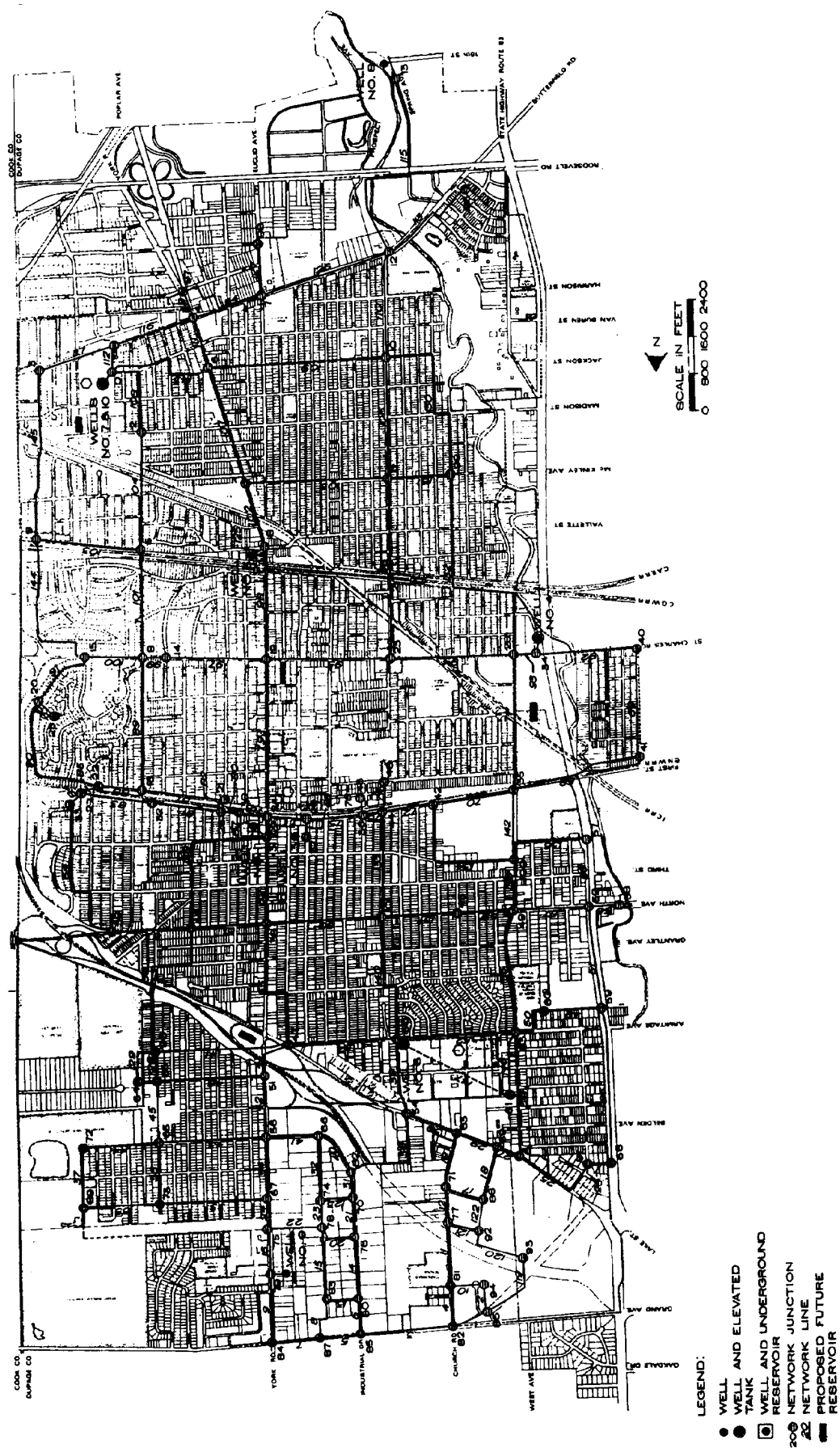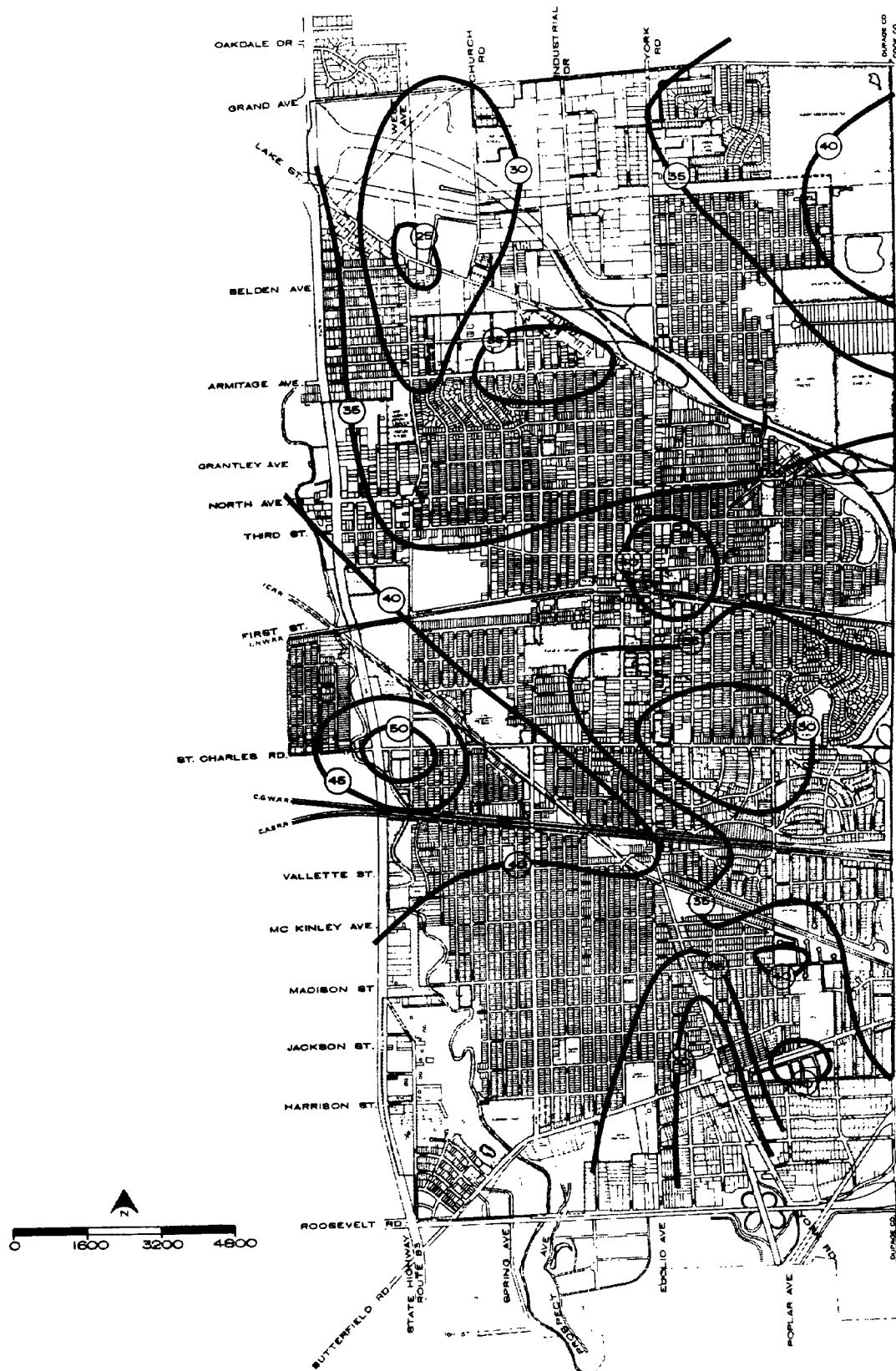
Figure C–1. System Network for Hydraulic Analysis.

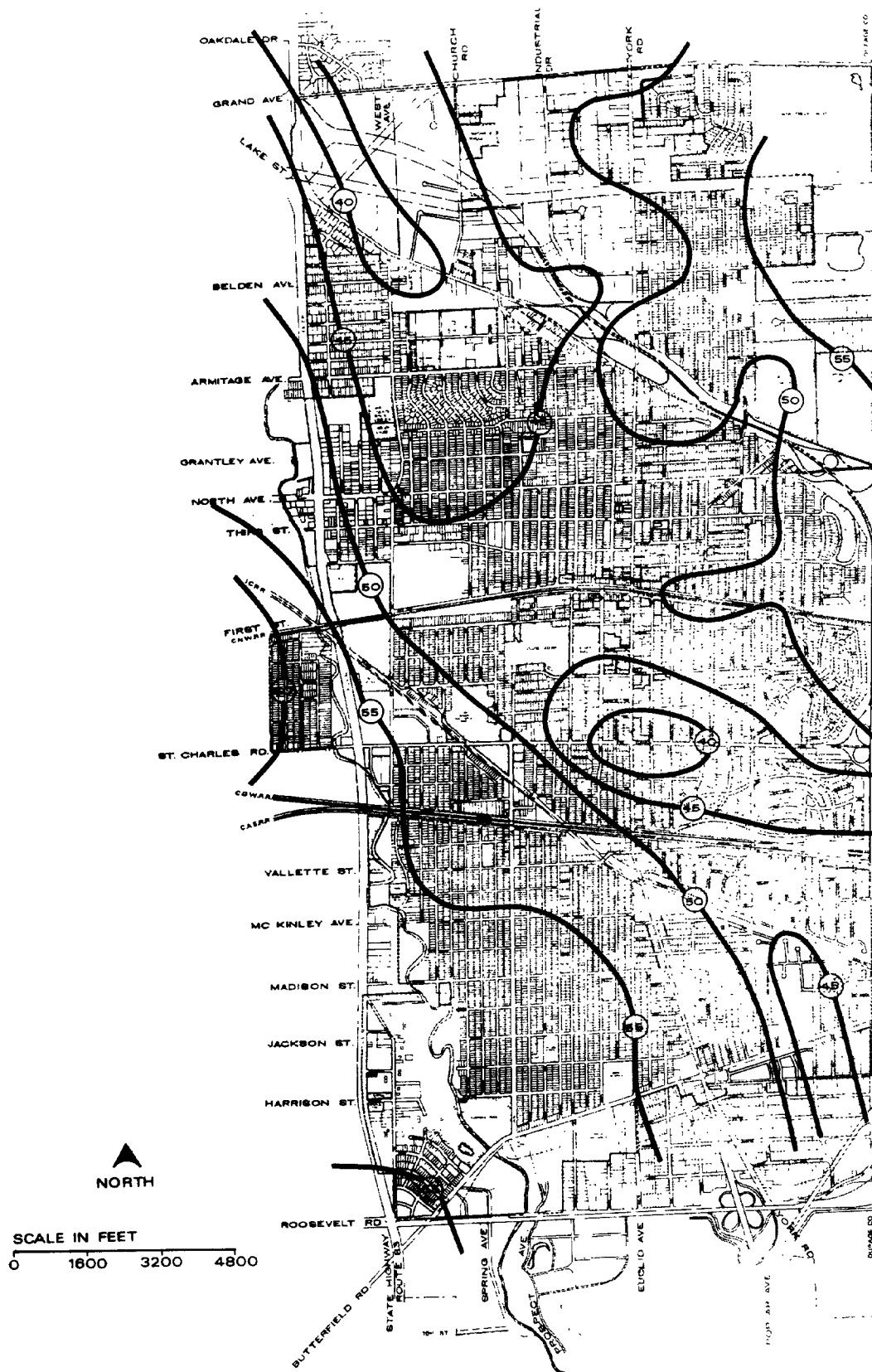*Figure C–2. Existing Distribution System-Maximum Daily Consumption.*

Figure C–3. Improved Distribution System-Maximum Daily Consumption.